Katsuhiko KONDO*: **Chromosome numbers in *Drosera* and *Dionaea* in North Carolina****

近藤勝彦*：ノースカロライナ産モウセンゴケ属とディオネア属の染色体数**

Five species of *Drosera* in the Droseraceae and one species of *Dionaea* in the Dionaeaceae are known in North Carolina (Radford, Ahles, and Bell, 1964 and 1968). The genus, *Drosera*, consists of a great number of species in the world, and *Dionaea* is a monotypic genus, endemic to North Carolina and South Carolina, and has distinct leaves characteristically very different from those of *Drosera*. *Dionaea* often had been included in the Droseraceae in previous papers (e.g., Diels, 1906; Wood, 1960).

Since both genera taxonomically are closely related to one another, they should be examined cytologically for evidence which would contribute to a satisfactory classificatory treatment. Cytological observations on *Dionaea* have made by Smith (1929) and others on *Drosera*, chiefly by Behre (1929) and Wood (1955). Behre (1929) especially has shown karyotype relationships between *Drosera* and the related genera, *Drosophyllum* and *Dionaea*.

The author here supplies additional data on chromosome observations in both *Drosera* and *Dionaea* in North Carolina.

Materials and methods. The materials used in this study were collected by the author in North Carolina in 1969. The PMC's were fixed in Carnoy's solution of 6 parts ethanol, 3 parts chloroform, and 1 part of glacial acetic acid. Observations were made by the aceto-carmine squash method.

Results and discussion. Each observation on species of *Drosera* in North Carolina showed 10 ring-shaped bivalent chromosomes at metaphase I of meiosis. The bivalents were normal and consisted of two elements of equal

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Table 1. Chromosome numbers in *Drosera* and *Dionaea* in North Carolina.

Species name	Chromosomes n	Chromosomes 2n	Source	Author
Drosera capillaris Poir.	10 II		Pender Co.	Wood, 1955
			Columbus Co.: 15 miles southeast of Old Dock, on Hwy. N.C. 130.	Kondo*
			Duplin Co.: 3.4 miles northwest of junction Hwy. 50 & 53, on Hwy. N.C. 50.	Kondo*
			Onslow Co.: ca. 10 miles southeast of Maple Hill, on Hwy. N.C. 50.	Kondo*
Drosera filiformis Raf.	10 II		Columbus Co.	Wood, Channel and Rock, 1955
			Columbus Co.: north of Old Dock, on Hwy. N.C. 130.	Kondo*
Drosera intermedia Hayne	10 II		Columbus Co.	Wood and E. Anderson, 1955
			Columbus Co.: 15 miles southeast of Old Dock, on Hwy. N.C. 130.	Kondo*
			Brunswick Co.: Boiling Spring Lake.	Kondo*
			Duplin Co.: 3.4 miles northwest of junction Hwys. 50 & 53, on Hwy. N.C. 50.	Kondo*
			Onslow Co.: ca. 10 miles southeast of Maple Hill, on Hwy. N.C. 50.	Kondo*
			Pender Co.: on dirt road which turn, north of Hwy. N.C. 50, 2.2 miles southeast of Maple Hill.	Kondo*
Drosera leucantha Shinners (*D. brevifolia* Pursh)	10 II	20	Carteret Co.	Wood, 1955
	10 II		Durham Co.	R.B. Channell, 1955
			Columbus Co.: 12.4 miles southeast of Old Dock, on Hwy. N.C. 130.	Kondo*

Drosera leucantha Shinners (*D. brevifolia* Pursh)	10 II		Onslow Co.: ca. 10 miles southeast of Maple Hill, on Hwy. N. C. 50.	Kondo*
			Pender Co.: on dirt road which turn, north of Hwy. N. C. 50, 2.2 miles southeast of Maple Hill.	Kondo*
Drosera rotundifolia L.	10 II		Ashe Co.: Bulf Mt.	Kondo*
			Watauga Co.: Long Hope Creek Valley.	Kondo*
Dionaea muscipula Ellis			Brunswick Co.: 3.3 miles north of junction 17 and 130, near Shallottee City, on Hwy. N. C. 130 (Kondo 415)	Kondo*
	15	30	near Wilmington City	Smith, 1929
		32	unknown (cult. Hamburger Botanischen Garten)	Behre, 1929
			unknown (cult. Bot. Gard. Tokyo Univ.)	Sato, 1948
	16 II	32	Brunswick Co.: 3.3 miles north of junction Hwys. N. C. 17 & 130, near Shallottee City, on Hwy. N. C. 130.	Kondo*
			Onslow Co.: ca. 10 miles southeast of Maple Hill, on Hwy. N. C. 50.	Kondo*

* The chromosome numbers of 6 species in different locations in North Carolina are here reported.

size. The meiotic divisions in the PMC's were very regular.

Members of *Drosera* show heteroploidy, and their basic chromosome numbers are 7, 8, 10, 17 and 23. According to Diels' Droseraceae in Das Pflanzenreich, the species of *Drosera* in North Carolina are taxonomically in Sect. VII. Rossolis. The basic chromosome number of *Drosera* Sect. VII. Rossolis is 10. The chromosome numbers of *Drosera* in North Carolina indicate that there are obviously homoploid relationships between these species.

Dionaea muscipula showed 16 ring-shaped bivalent chromosomes at metaphase I of meiosis. The bivalents were closely conjugated at both ends and consisted two elements of equal size. The meiotic divisions in the PMC's

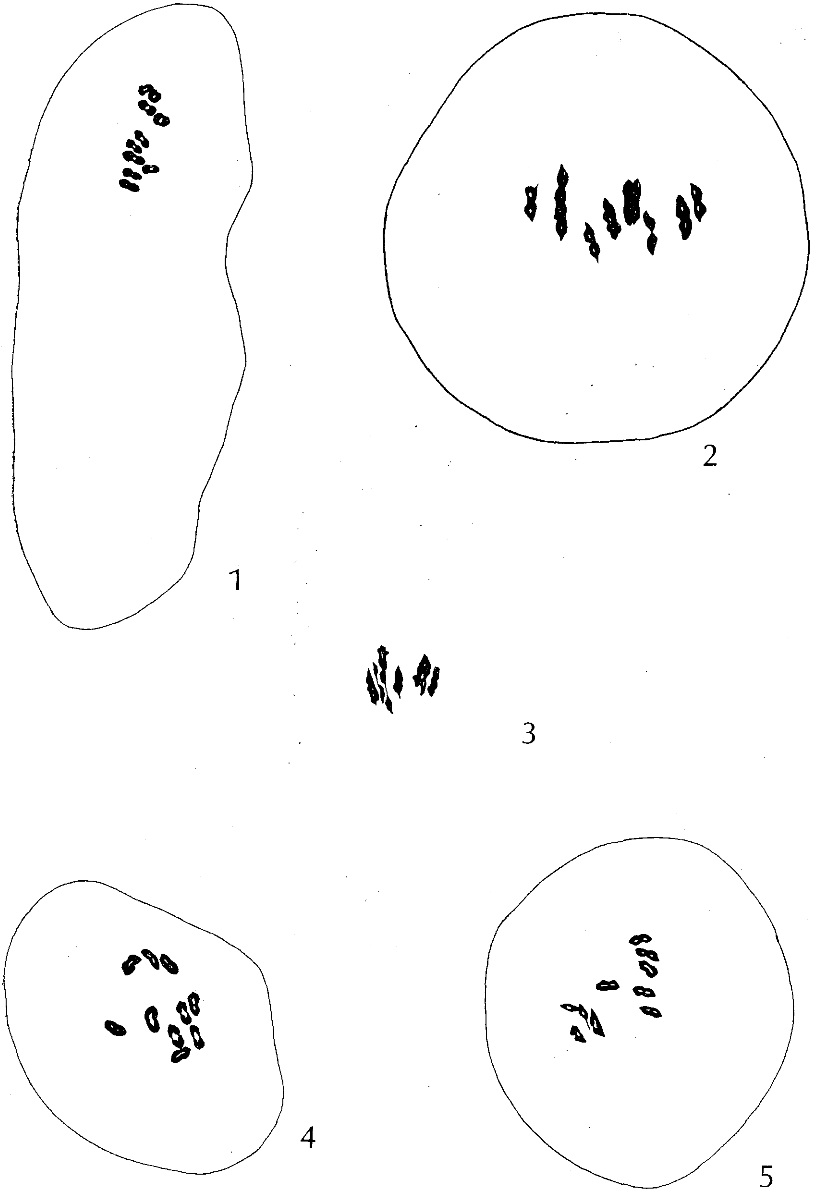

Fig. 1–5. Chromosomes (× ca. 760) in pollen mother-cells of:–Fig. 1. *Drosera capillaris* Poir. (10 II).–Fig. 2. *Drosera filiformis* Raf. (10 II).–Fig. 3. *Drosera intermedia* Hayne (10 II).–Fig. 4. *Drosera leucantha* Shinners (10 II).–Fig. 5. *Drosera rotundifolia* L. (10 II).

were very regular.

Behre (1929) and Sato (1947) reported 32 somatic chromosome numbers in *Dionaea muscipula*. The chromosome count of *Dionaea muscipula* (n=15 and 2n=30) reported by Smith (1929) makes it questionable as to whether this material was a heteroploid. The author infers that the basic chromosome number of *Dionaea muscipula* is 8 (or 16) and that it is constant.

Thus it appears that both *Drosera* and *Dionaea* are in the same family with the same basic chromosome number. The same somatic chromosome number as found in *Dionaea muscipula* was shown in *Drosera pedata* Pers. (2n=32: Sato 1948, and Kondo unpublished), which is a synonym of *Drosera binata* Labil. which is distributed in New Zealand and the eastern part of Australia. According to the author's observations on both *Drosera pedata* and *Dionaea muscipula*, their karyotypes were morphologically similar but the somatic chromosomes in *Dionaea muscipula* were larger than those in the other species. Behre (1929) said, "Sie hat 32 gedrungene, zum Teil schwach bisquitförmige Chromosomen, die im ganzen den Charakter der *Drosera*-Chromosomen voll wahren". However, both *Drosera* and *Dionaea* are similar not only in many taxonomic characters but also in karyotypes, although one has been placed in the Droseraceae and the other in the Dionaeaceae. The chromosome constitution indicates these genera are closely related, and may be placed in the same family.

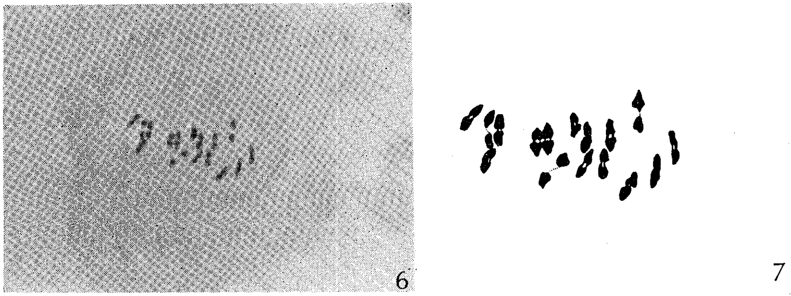

Fig. 6 and 7. Chromosomes in pollen mother-cells of *Dionaea muscipula* Ellis (16 II). Fig. 6: × ca. 380; Fig. 7: × ca. 1310.

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ノースカロライナ州に自生するモウセンゴケ属とディオネア属の染色体数について検討した。ハエトリソウの染色体数は観察したすべての個体において体細胞で $2n=32$, 花粉母細胞で $n=16$ を記録した。Smith (1929) の報告した $n=15$, $2n=30$ の染色体数には疑問がもたれる。ハエトリソウの核型はモウセンゴケ属のそれに似て，関連ずけられ，両属が近縁なることを示唆している。ディオネア属にディオネア科という別科を建てるよりも，従来通り，モウセンゴケ科の一属としておくべきであろう。

□高取治輔：**日本の薬用植物 続**，31×23，彩色写生図 80，154，1970，価 ¥18,000，広川書店。この本は高取博士が「日本の薬用植物」と題して，1966 に刊行されたものの続篇で，前篇と同じく自から写生彩色されたもので，86 種の植物が図説してある。その内容形式については既刊を知る人には，こゝで，こと新しく紹介する必要もなかろう。製本装訂については，広川書店の独特入念のもので，見事な出来である。この 2 冊で日本薬用植物がほとんど明らかになったことはたしかである。 (久内清孝)